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JAN 9 - 1934

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



JANUARY 6, 1934

New President of A.A.A.S.

See Page 6

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SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XXV

No. 665

The Weekly  Current  
Summary of Science

Published by

## SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—\$5.00 a year postpaid; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Canadian and foreign subscribers please add two dollars (\$2.00) per year to regular subscription rates to cover postage.

In requesting change of address, please give your old address as well as the new one in notification to Circulation Department, SCIENCE NEWS LETTER, 21st and Constitution Ave., Washington, D. C., at least two weeks before change is to become effective.

Advertising rates furnished on application.

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Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserv. Washington. Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. and Canadian Patent Office.

## DO YOU KNOW?

The Texas grapefruit crop was seriously reduced by autumn storms.

Moscow, capital of the Soviet Union, has a population of about four million.

At least 17 species of frogs are native to the United States and Canada, but few are of commercial value.

More than 85,000 persons joined in the Biological Survey's rat destruction campaign in the year ending June 30, 1933.

A pair of wolves often cover from 100 to 150 miles of territory around their den while foraging for their young.

Electric lamps of only 3-watt consumption that bring "moonlight" indoors, are the latest all-night lamp developed.

Chemists have found that if the calcium content of milk is reduced with zeotile, the curd formed in the stomach assumes a more easily digestible, flaky condition.

The 150-mile Baltic-White Sea Canal, built by Soviet engineers, has 12 locks and 15 dams.

Glaciers are divided into "living" and "dead" according to whether they are actively receding or not.

The art of blowing glass was learned, archaeologists believe, shortly before the Christian era in either Syria or Egypt.

An open air museum has been established at Lake Constance, Germany, where there were over 30 villages of lake dwellers in prehistoric times.

Experiments show that if Kieffer pears are ripened at 60 degrees Fahrenheit, they have the best flavor and texture, and compare favorably with Bartlett pears.

The government will kill two birds with one stone by buying 100,000 sheep from the overgrazed Navajo Indian sheep range, and giving the sheep as food to destitute Indians of northern states.

## WITH THE SCIENCES THIS WEEK

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*These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.*

## PHYSIOLOGY

# Tissues, Rather Than Blood, Fight Invasion by Germs

Discoveries That Reverse Usual Medical Thought Bring \$1,000 Prize to Professor Kahn of University of Michigan

**EDITOR'S NOTE:** The annual \$1,000 prize for a notable paper delivered before the American Association for the Advancement of Science at its winter meeting just closed in Boston was awarded to Dr. Reuben L. Kahn, director of the Laboratories of the University Hospital and assistant professor of bacteriology at the University of Michigan, for his paper entitled, "Tissue Reaction in Immunity: The Specific Reacting Capacities of Different Tissues of an Immunized Animal," which is reported herewith.

Prof. Kahn has already received previous honors for his internationally known Kahn test for syphilis. He was born 46 years ago at Kovno, Lithuania, and is a naturalized citizen.

**A** NEW idea of how the human body fights its defensive battles against disease invasions was presented to the American Association for the Advancement of Science by Prof. Reuben L. Kahn, of the University of Michigan, who reported evidence that skin, muscles and other fixed tissues, and not the blood, are the "shock troops" in our continual struggle to keep healthy.

Usual medical thought considers the protective forces against germ invasion centered largely in the blood and other body fluids in which are found phagocytes, or bacteria-eating cells. Skin and muscle are usually considered hypersensitive to the same germ that, because of protective immunization, is subdued by the blood.

Experimenting with rabbits treated with much the same sort of serum that is so successfully protecting thousands of children against diphtheria, Prof. Kahn finds that skin and muscle as well as blood receive immunity when the living body is given protective treatment. In fact the skin, probably because it has been the armor of the body throughout the ages against attack by germs and other harmful agents, is ten times as effective as muscle, brain or blood in combining with and subduing the invading material.

Immunity is an ability to detect and then anchor, or combine with, an invading substance; and the great serv-

ice rendered by a tissue is this combining with the dangerous substance in order that it may not spread throughout the body with disastrous results. Prof. Kahn explained that in a germ disease this combining capacity of the tissue may determine whether the trouble is localized or whether the organisms run riot throughout the body. Sometimes the ability to protect is not evident from the blood yet the skin is on its protective job. This is the case sometimes in Malta fever and in boils caused by staphylococci.

The inflammation of infection, as in a boil, is really something to warrant rejoicing because it means that the invading organisms are being destroyed and eliminated.

Further studies by Prof. Kahn promised to explain some puzzles about infection and give information that physicians may be able to use in actual treatment of disease, enabling them to fight germ diseases more successfully than at present.

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## HEREDITY

# Only 48 Ancestors Really Count in Your Heredity

**O**F ALL your ancestors, no more than 48 really count so far as your hereditary traits are concerned, it appears from a discussion of the contribution of genetics to anthropology given by Prof. C. H. Danforth of Stanford University at the meeting of the American Association for the Advancement of Science.

"It used to be thought that all of one's ancestors in any generation contributed about equally to his heredity," Prof. Danforth said.

"It now appears that, on account of the limited number of human chromosomes, at least one grandparent of the



## PLENTIFUL PROTONS

*Drs. Lamar (left) and Luhr (right) examine their apparatus which makes protons nine times more abundantly than previous devices.*

## PHYSICS

# Proton Production Improved For Bombardment of Atom

**A** PLENTIFUL supply of atomic bullets for shooting at other atoms in the hope of transmutation and atomic energy release is assured by a recent Massachusetts Institute of Technology discovery.

A source of protons that (Turn Page)

sixth generation back contributes nothing whatever and may as well not have existed so far as direct heredity is concerned.

"Following this line of reasoning we are led to conclude that those racial groups which show a high degree of uniformity or the frequent recurrence of particular types have really descended from only a few genetic ancestors, however numerous their genealogical ancestors may have been."

The influence of genetics on anthropology may be seen in the change in attitude toward the origin of racial differences, Prof. Danforth pointed out.

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is nine times as prolific as any previously known was devised by Drs. Edward S. Lamar and Overton Luhr, working in the new Eastman Research Laboratories. Protons are the positively charged kernels of hydrogen atoms and the most effective projectiles known to science for atom smashing.

Their new source is an electric arc operating in hydrogen at low pressure between an incandescent filament and a neighboring metal electrode. Ordinarily such an arc would produce ions of which about ten per cent. would be protons and the remainder molecular ions. However, by surrounding the arc with a third electrode maintained at a negative potential of a few hundred volts,

the percentage of protons produced is immediately increased to approximately 90 per cent. Dr. Lamar and Dr. Luhr are hopeful of still further raising the percentage.

The new proton source will be applied to the 10,000,000 volt Van de Graaff direct current generator recently tested at M. I. T.'s research station at Round Hill, Mass. Dr. Karl T. Compton, M. I. T.'s physicist-president, who collaborated in investigations out of which the Lamar-Luhr discovery arose, explained that protons speeded at 7,000,000 volts in the Van de Graaff generator are as effective as ordinary charged hydrogen molecules sped by twice that voltage, 14,000,000 volts.

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#### PSYCHOLOGY

## Child Prodigies Lose In IQ As They Grow Older

**D**O EXCEPTIONALLY bright children keep their intellectual advantage over their fellows after they are grown?

The answer would seem to be in the negative, to judge from an investigation being conducted at the Graduate School of Education, Harvard University. A report of progress of this investigation was made to the American Association for the Advancement of Science by Prof. Edward A. Lincoln.

The intelligence quotients of superior pupils, as measured with the Stanford Binet test, drop substantially during a period of five or more years, and girls lose more than boys, Prof. Lincoln found. The pupils who were re-examined after a lapse of only two years did not show as great a loss; thus apparently it does not occur early in the school career.

### Late Talking Explained

Intelligent children who do not learn to talk until they are 3 to 5 years old and then continue to use "baby-talk" are very likely suffering from a short memory span for sounds, members of the American Association learned from an address by Samuel D. Robbins, director, Boston Stammerers' Institute.

Memory span is measured by having the child repeat after you a group of numbers. The average child of three can usually repeat three digits correctly, but cannot repeat four correctly as often as once out of three trials.

Sixty per cent. of the children examined by Mr. Robbins because they were a year or more late in talking were found by him to have short auditory memory spans.

"Since language is learned by sound imitation, children who have a short memory span are at a great disadvantage in acquiring it," he said. "Although they may learn to understand many of the most common words they hear spoken in the home, they are often unable to reproduce words containing three or more different sounds until they are from three to six years of age, depending on how much their auditory memory span is retarded.

"As most words in common use contain three or more sound units, these children are unable to reproduce ordinary words. The task of repeating a word after another person seems so hopeless and impossible to them that they will not even attempt it."

"Children who are handicapped with short auditory memory should not be taught words containing more sound units than the length of their auditory spans," Mr. Robbins advised. "If it is necessary that a child learn a word or syllable containing more sound units than the length of his auditory memory span, this must be built up from shorter units within the child's span, as 'eat, t-r-eat, s-street, street-s.'"

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#### CHEMISTRY

## Odors Described By Numerical Tagging

**"A** ROSE by any other name would smell 6523."

This revised version of a famous saying occurred to many scientists at the meeting of the American Association for the Advancement of Science when they viewed a flavor and odor chart devised and exhibited by Ernest C. Cricker and Lloyd F. Henderson, associated with Arthur D. Little, the Cambridge, Mass., industrial chemist; for 6523 is the odor formula for the rose.

Other smells can be given numerical labels of this sort and these can be used to designate them just as numbers are convenient in tagging convicts and motor cars.

Each digit expresses one of four components in odor sensations, which in order of writing are fragrant, acid, burnt, and caprylic. The numbers indicate intensity on a scale of eight. The meaning of caprylic may be understood if it is known that the word is derived from "goat."

Mothballs, or naphthalene, in this code rate 4564, while the familiar gas of rotten eggs, hydrogen sulfide, is 5346. The sweetest smell reduced to this odor code so far is that of vanillin, 6021, and that may explain why so many of us like vanilla flavoring.

A rather terrible smell, strangely used as a basis for some of the most expensive perfumes, is skunk-like civet, 5777. But the scale failed when the chemists attempted to express the still more disagreeable smell of butyl mercaptan.

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#### ECONOMICS

## Formula Devised To Gage Gasoline Demand

**A** NEW mathematical formula makes it possible to predict more exactly the effect of a change in prices or taxes on gasoline consumption. Announcement of the formula was made before the Econometric Society meeting in Philadelphia by Victor Perlo and Dr. C. F. Roos of the Division of Economic Research and Planning of the NRA.

In their statistical study, the two mathematicians studied the factors which affect gasoline consumption, not merely in the United States as a whole, but in local, state variations.

A one cent increase in the price of

gasoline in Pennsylvania causes the motorist to use 12 gallons less gas in a year, they found. In Kansas a one cent increase causes a decrease of only three gallons. An added mile of good highway increases gas consumption twice as much in Virginia as in Mississippi.

Psychological factors play a part, they reported. In 1926, Virginia increased its gasoline tax by one and one half cents. The decrease in gas consumption which followed was twice as great as that following a one and a half cent increase in gasoline price. This same tendency was noted, to greater or less degree, in all the states studied.

Consumption of gasoline is influenced not only by prices and taxes, but by such factors as road building, fluctuations in purchasing power and registration fees. The net effect of influencing factors is expressed by the mathematicians in the formula which they call "the demand law for gasoline."

"This formula enables us to tell within two per cent. the annual consumption of gasoline per motor vehicle, if we know price, highway mileage, and the other factors involved," the report stated. "It can be used to determine the desirability of proposed changes in any of these factors, so far as they relate to gasoline consumption."

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## ASTRONOMY

## Super-Hurricanes Found In Atmospheres of Distant Stars

### Atmospheric Velocity of About 40 Miles per Second Revealed on Faint Star, But Sun's Wind Speed is Zero

**G**REAT WINDS blow in the atmospheres of the distant stars compared with which the hurricanes of the earth's atmosphere are mere zephyrs.

Dr. Otto Struve and Dr. C. T. Elvey, of Yerkes Observatory of the University of Chicago, announced to the American Association for the Advancement of Science that while the outer gaseous atmospheres which surround the luminous lower strata of the stars have heretofore been assumed to be relatively quiescent, they have discovered in the rainbow spectra of stars evidence that powerful turbulent currents exist in the atmospheres of many stars.

Spectroscopic phenomena that have puzzled astronomers for years are now explained, and Drs. Struve and Elvey even measure the most frequent wind velocity of individual stars. The faint star known as 17 Leporis has an atmos-

pheric velocity of about forty miles per second. In epsilon aurigae it is twelve miles per second, and in the first magnitude bright star Alpha Persei it is about four miles per second.

In the sun, which is a star, there is practically zero wind velocity, however. The winds in the stars may be likened to the winds on earth although the densities of stellar atmospheres are much lower than the density of earthly air.

### May "See" Invisible Stars

Astronomy seems to be on the verge of being able to "see" the invisible star light, both longer and shorter in wavelength than visible light from the stars, that can not now be satisfactorily studied by conventional telescopes and mirrors. Dr. Paul W. Merrill, of the Carnegie Institution's Mt. Wilson Observatory, told the astronomers.

Photoelectric cells, new photographic emulsions, and thermocouples, bolometers and radiometers, devices for measuring feeble temperature differences, are being improved to such an extent that astronomers should in the near future be able to extend their present fragmentary knowledge of the distribution of energy in the stellar spectra.

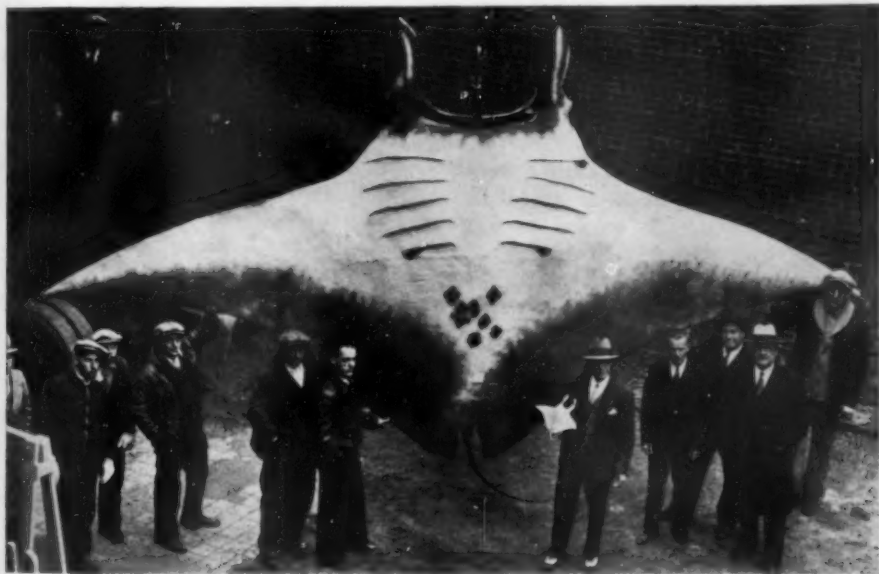
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## MEDICINE

## Anesthetic Rivals Ether In Certain Operations

**E**XPERIENCE with a new anesthetic which is injected directly into the blood and which may prove as valuable as ether for certain types of surgical operations was reported by Dr. Gavin Miller of Montreal, to the Canadian Medical Association.

The new anesthetic is called evipan and was produced by a German pharmaceutical manufacturer. It has been tried extensively in Germany and England. Only one death was attributed to the anesthetic in over 20,000 cases in which it was used. Chemically, evipan is



*New York World-Telegram*

### ACCIDENTAL DEATH FAR FROM HOME

This giant devilfish (*Manta birostris*) snagged itself in the anchor chain of a fish-boat off Deal, N. J., during the past August. An unusual catch so far from warm waters, the giant manta proved interesting to Dr. Henry W. Fowler of the Philadelphia Academy of Natural Sciences, who examined it. He measured the fish's width as twenty feet four inches and estimated the weight to be between 3,000 and 4,000 pounds. The specimen is a female and, as it was hoisted in, gave up one young which is held by a man near the center of the photograph. This huge fish had apparently not been eating smaller fish, for its estimated 40-gallons of food examined by Dr. Fowler was made up entirely of minute plankton and necton without apparent trace of fish tissue or bones.





#### BEFORE AND AFTER

*Peter K. was suffering from suicidal phantasies; he drew pictures like the one at the top. After treatment and emotional improvement, his pictures were very different, like that at the bottom.*

known as the sodium salt of N-Methyl-C.-C.-cyclohexenyl - methyl - barbituric acid.

The anesthetic, injected directly into the blood stream through a vein in the arm, produces a deep, normal sleep within thirty seconds. The operation can be started immediately. After the operation the patient awakens easily and gradually without any unpleasant after-effects. In Dr. Miller's experience, evipan is more effective if morphine or a similar drug is given first.

"If further investigation confirms my present experience," he concludes, "this drug may become as valuable to the surgeon as ether or novocaine for suitably chosen operations."

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## Dr. Thorndike Honored

See Front Cover

Dr. Edward L. Thorndike, psychologist and educator of Teachers College, Columbia University, was elected president of the American Association for the Advancement of Science. Dr. Thorndike, whose picture is reproduced on the cover, has been associated with Teachers College since before the turn of the century and is known to all students of education for his theories of learning and habit formation.

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#### PSYCHIATRY

## Emotional Difficulties of Children Revealed in Play

**Puppets of Hated Elders Torn Apart to Relieve Strain; Drawings Reveal Thoughts That Fill the Young Mind**

**T**HE PLAY of children, if observed scientifically, gives an excellent clue to what is hidden in their minds, members of the American Psychoanalytic Association, meeting in Washington, learned from a report of Dr. Edward Liss, school psychiatrist of New York City.

Dolls and puppets used in dramatic plays and games in which the children act out a story, as well as story-telling and artistic composition in clay modeling, soap sculpture, and drawing, all reveal significant matters which the child is not able to put into words even if he were willing, Dr. Liss found in attempting the psychoanalysis of children.

One toy, used by Dr. Liss to bring out the suppressed hatred which children sometimes feel toward others, is a doll which can be taken apart merely by tugging at its many ball-and-socket joints. The child will pretend that the doll is the governess, or father, or whoever is resented, and then will yank off the arm or head with great energy. This serves to work off the child's emotional tension, as well as to reveal to the psychoanalyst the source of his trouble.

Peter K., a nine-year-old who was referred to Dr. Liss for examination because he was suffering from depression and suicidal phantasies, was allowed to make drawings without any direction. These drawings were full of action and showed the thoughts that were filling Pete's young mind. Scenes of physical violence and fires and other exciting catastrophes were the subjects he selected. Very different were the pictures drawn after he had been under treatment and had improved emotionally. These were the peaceful landscapes more commonly drawn by children.

Adults, too, betray their emotional condition through their creative efforts and creative play. Dr. Liss exhibited to the scientists two paintings made by a promising young artist. He came to Dr.

Liss for treatment, not because he was having difficulty with his art, but because he was a delinquent with kleptomaniac tendencies.

The first picture, painted when his troubles were at their height, is very peculiar in style, eccentric in the use of color as well as in the composition. The second, done after he had gotten well, was in an entirely different style and shows that the boy has real talent when his emotional state does not interfere with its expression.

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#### ARCHAEOLOGY

## Egypt Keeps Rank As Civilization Pioneer

**E**GYPT is still the land of "first things." Despite recent discoveries of antiquity in other lands, Egypt still holds her place as the country which led and pioneered in civilization, Dr. George S. Duncan of the American University told the Archaeological Institute of America meeting in Washington.

Egypt reached a higher quality of civilization for the same given periods, than did either India or Mesopotamia, Dr. Duncan pointed out.

The oldest artifacts in the world have been discovered in Egypt, he said, citing numerous instances of Egypt being "first." Stone tools found in the old Nile Bed, the oldest Egyptian hammers and first hatchets are pronounced several hundred thousand years old at least.

The first large organized government in the world's history, so far as is known today, was established in Egypt by 3400 B.C. with one ruler, the Pharaoh, at its head, Dr. Duncan continued. Other lands had city states with a king or local ruler over each. In Babylonia, the first union of states did not take place until 2000 B.C.

The earliest known physician, Imhotep, served an Egyptian pharaoh of the Old Kingdom, 2980-2475 B.C.

There were medical specialists, even in the Old Kingdom. Physicians of the palace included an eye specialist, a stomach and bowel specialist, and a palace dentist.

The oldest immortality texts in the world are in Egypt, in pyramids of 2600 B.C., though some of the material is much older, going back to 4000 B.C. as shown by allusions in the text.

Dr. Duncan cited the oldest known will, written by an Egyptian pharaoh Amenemhat IV, 1800 B.C., and bequeathing his property in surprisingly "modern" legal style.

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## GEOLOGY

## Alaskan Glacier Advances While Others Retreat

**T**HE ONLY known case of an Alaskan glacier advancing was called to the attention of the Geological Society of America by Dr. Chester K. Wentworth and Louis L. Ray of Washington University, St. Louis, Mo.

During the past fifteen or twenty years, Dr. Wentworth said, Alaskan glaciers generally have been melting back faster than they have been flowing forward. The net loss has been as much as 170 feet in some glaciers, as little as 20 feet in others. But the Taku glacier alone has been in rapid forward movement. It has advanced 7,600 feet since 1909.

The cause of this anomalous advance is a mystery. Dr. Wentworth suggested the possibility of an earthquake's having caused the dumping of a huge quantity of snow on the glacier, perhaps in 1899 or at some time since.

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### THE MYSTERY OF THE OCEAN

an address by

**Dr. Paul S. Galtsoff**

Of the Bureau of Fisheries,  
U. S. Department of  
Commerce

Wednesday, January 10, at  
4:30 p. m., Eastern Stand-  
ard Time, over Stations of  
the Columbia Broadcasting  
System. Each week a promi-  
nent scientist speaks over  
the Columbia System under  
the auspices of Science  
Service.

## MEDICINE

# Seek to Make Practical Use Of Tuberculosis Discoveries

## Carriers of Dysentery Parasites Found to Be Numerous; Familiar Coal Tar Dyes Combat Skin Infections Effectively

**S**IGNIFICANT differences between the germs that cause tuberculosis in humans and those responsible for the disease in other animals have been discovered, and a corps of research workers are hard at work upon the difficult task of attempting to translate these research findings into methods of preventions and cure that doctors can use, Dr. William Charles White, Chairman of the National Tuberculosis Association's Committee on Research, revealed to the American Association for the Advancement of Science.

The human tubercle bacillus has within itself one substance, a fatty acid, that occurs in none of the other tubercle germs, Dr. R. J. Anderson, of Yale, has discovered. The chemical substance is able to produce the tubercle growths characteristic of the disease without the presence of the bacilli themselves. So far, Dr. Anderson's studies have been confined to only one strain of the kind of bacilli occurring in human beings, but the research is being rushed to include all the human strains.

Another promising lead to the possible conquest of the white plague is the fact that the germs that cause the disease have much greater difficulty getting along without oxygen than the germ strains that are relatively harmless. Again this peculiarity has not been practically applied.

Preparations are being made to study the life, loves and experiences of a single individual tubercle bacillus, Dr. White explained. Heretofore only large colonies or "herds" of the germs have been observed because of the difficulty of singling out individuals.

### One Out of Three

One out of three persons of a typical college group has within his body an ameba parasite similar to the sort that caused the amebic dysentery epidemic in Chicago last summer that resulted in the death of "Texas" Guinan and several others, Drs. D. H. Wenrich, R. M. Stabler and J. H. Arnett, of the

University of Pennsylvania, reported.

Although many of those carrying these minute animal parasites are not ill in any way, they are carriers who, through carelessness, may spread the disease to others and thus menace the community. Very careful diagnostic work is often necessary to locate these potentially dangerous carriers, the Pennsylvania scientists said.

### Green Dye For Skin

Two familiar green aniline dyes made from coal tar are effective in combating and subduing some of the common skin infections that are due to fungi, Dr. A. McCrea, of Parke, Davis and Company, Detroit, reported. These dyes, known as malachite green and brilliant green, were found to be outstanding in killing action, far surpassing all others tested, including aniline violet, fuchsin basic and gentian violet.

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## PHYSIOLOGY

## Too Easy Living Injures Insulin-Producing Gland

**E**ASY living is hard on parts of the pancreas that produce insulin; abstemiousness tends to repair the damage.

This has been shown in the case of fish by Dr. Walter N. Hess of Hamilton College, who described his experiments before the American Society of Zoologists. Dr. Hess used rainbow trout as his subjects. Some of them he overfed, others he put on a diet too high in fat-forming foods, and still others he fed normally but kept under-exercised.

In all cases, the islets of Langerhans in the pancreas, which are the insulin-producing areas, diminished in number and degenerated in condition. However, Dr. Hess put similarly pampered trout on a diet low in fat-producing materials and after a while the damaged tissue showed considerable regeneration.

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## ZOOLOGY

**Slow Growth Responsible For Female Longevity**

**T**HE FEMALE of a species lives longer than the male because she grows more slowly. This new explanation of the greater longevity of females was furnished by experiments with rats reported by C. M. McCay and Mary F. Crowell of Cornell University at the Boston meeting of the American Society of Zoologists.

They found in the course of their experiments, begun three years ago, that an animal that grows slowly will live longer than one that matures rapidly. The growth of the animal can be retarded, with subsequent longer life, by restricting the calories it is fed.

In a group of animals fed a normal diet and growing at the normal rate, the males had much shorter life spans than the females, but in the slow-growing group the males and females lived almost exactly as long as each other.

*Science News Letter, January 6, 1934*

## PALEONTOLOGY

**Fossil Crocodile Found in Kansas**

**K**ANSAS once had crocodiles. Solid evidence to this effect has been found by Dr. M. G. Mehl of the University of Missouri, who described his discovery before the meeting of the Paleontological Society. Dr. Mehl's discovery consists of a fossilized crocodilian skeleton, its skull and some other parts missing. From the parts that remain, the original length is estimated at about twelve feet. The skeleton was uncovered near Salina, Kansas.

*Science News Letter, January 6, 1934*

## PHYSIOLOGY

**Turtle Hearts Beat After Liquid Air Freeze**

**Y**OU CAN'T make it too cold for a turtle's heart. Not even the terrific frigidity of liquid air can stop it.

At the meeting of the American Society of Zoologists in Boston, E. Alfred Wolfe and Richard A. Torgesen of the University of Pittsburgh told of their experiments with the tough hearts of these sluggish reptiles.

As is well known, the heart of a turtle will keep on beating for hours after its owner has been killed and the

organ itself removed from its body. Such excised hearts were immersed in liquid air, at a temperature of 192 degrees Centigrade below freezing, for 3, 5, 7 and 10 minutes respectively. Then they were placed in a cold physiological solution and allowed to thaw out gradually. The hearts resumed their beats within a few minutes. At first the beats were irregular and slow, but within a few minutes more they were pulsing regularly, though somewhat more slowly than other turtle hearts that had not been given such a drastic chilling.

As all the hearts gradually slowed down during a three-hour period, it was noted that the ones given the longest freezing became "tired" first. Hearts exposed to freezing for more than ten minutes did not resume beating at all.

*Science News Letter, January 6, 1934*

## CHEMISTRY

**Germicide Not Weakened By Organic Material**

**A** NEW chlorine compound that kills disease germs and other micro-organisms in the presence of certain living tissues was reported by Dr. Franz C. Schmelkes and his associates, Henry C. Marks, Isabelle B. Romans, Elizabeth S. Horning and Albert F. Guiteras, of the Wallace and Tiernan Products research laboratories, Belleville, N. J., at the meeting of the Society of American Bacteriologists.

The new product is called Azochloramid—short for the long chemical name N-N-dichloro-azodicarbonamidine.

One big advantage of the compound is that, unlike other germicides, it does not rapidly break down chemically and lose its effectiveness in the presence of organic material, milk and such body fluids as serum and pleural exudate. Indications are that the new compound will prove a better germicide and disinfectant under these conditions than iodine or Dakin solution.

A further desirable property of the new germicide is its bright yellow color which persists as long as the compound is active. Azochloramid is also substantially odorless and tasteless.

Another important characteristic of Azochloramid is its ability to kill germs without seriously injuring body tissues.

Unlike other antiseptics, Azochloramid is not markedly group specific. Clinical investigations of the difficult mixed infections emphasize the value of this property.

*Science News Letter, January 6, 1934*

**IN SCIENCE**

## BOTANY

**Plants' Stored Food Adds Length Only**

**F**OOD stored by a tree or shrub in its woody parts is subsequently used for growth, but only for growth in length—the formation of new shoots and leaves. It is not used to increase the thickness of the trunk or branches. Growth in thickness is accomplished only from food that has been made in the leaves a short time before.

This discovery was announced before the meeting of the American Society of Plant Physiologists by Dr. W. E. Loomis of Iowa State College at Ames. Woody plants do not grow thicker in spring until they have developed their leaves, Dr. Loomis said; and such growth in thickness can be stopped at any time in the season by stripping off the leaves or cutting off the lines of transport of food from leaves to trunk.

*Science News Letter, January 6, 1934*

## ORNITHOLOGY

**Bird Size of Bee Found in Haiti**

**A** BIRD no bigger than a good-sized bee, found in the Haitian highlands, is described in a new publication just issued by Dr. Alexander Wetmore, assistant secretary of the Smithsonian Institution. It is known as the Hispaniolan vervian hummingbird. In spite of its tininess it is quite pugnacious, as indeed most hummingbirds are, and does not hesitate to dart to the attack of birds as big as a mockingbird if it objects to their presence.

Among the other remarkable birds found in Haiti Dr. Wetmore and his companion, Frederick C. Lincoln of the U. S. Biological Survey, found a species of woodpecker that lives in community "apartment houses" instead of in solitary dwellings, after the fashion of the woodpeckers familiar in the North. They favor trees with hard trunks, and a whole group of them—a dozen pairs or more—will dig their nests out close together.

*Science News Letter, January 6, 1934*



# FORCE FIELDS

## STATISTICS

## Violent Death Claims Many More Men Than Women

**B**ETWEEN the ages of 15 and 50 four times as many men as women die from violence. This being the main working period of life when men are most exposed to the hazards of industry and of civil life, it is not surprising to find that external violence is the cause of death more often than any other factor, statisticians of the Metropolitan Life Insurance Company point out. They found that practically twice as many men die from violence at this age as from tuberculosis.

Comparing deathrates among men and women at this age, they found that the deathrate among men from accidents, homicides and suicides was just three and a half times that among women from childbirth causes.

"We have heard much during recent years regarding the needlessly high maternal mortality rates in our country," the report stated, "but the question may well be raised whether the regrettably high maternal deathrate is not far exceeded in serious consequences for society and the family by the high and largely avoidable deathrate from violence of various sorts among male wage-earners."

*Science News Letter, January 6, 1934*

## GEOPHYSICS

## "Silent Lightning" Pours From Air to Earth

**C**EASELESS currents of atmospheric electricity, of the same birth as lightning but coming without flash or sound, pour from the atmosphere into the earth. How scientists study this "silent lightning" was demonstrated at the annual exhibition of the Carnegie Institution of Washington.

Molecules of the gases that make up the atmosphere may gain or lose an electron, through the action of radioactive minerals in the earth, cosmic rays and other causes. Cosmic rays alone account for about a fourth of all such

electron additions or subtractions. Molecules thus affected become negative or positive "ions," and their drift through the atmosphere sets up the slow and silent, but none the less important, electrical discharges from air to earth.

Carnegie Institution scientists have discovered that the actual concentration of these charged molecules, or ions, is only a fraction of what was predicted on theoretic grounds. The ionization of the air is greatest over the seas and in other empty places, least over areas like great cities, where life is most concentrated and industry most active.

Other exhibits shown at the Carnegie Institution had to do with the development of plant societies, with the cellular "sociology" of certain cancerous conditions, with the atmospheres of the planets and the moon, the velocity of light, the accurately determined positions of thousands of stars, Mayan history and California earthquakes.

*Science News Letter, January 6, 1934*

## PHYSIOLOGY

## Coffee's Sobering-Up Effect Measured

**C**OFFEE'S sobering-up effect, after one has had a drop—or several—too many has long been known in a general, rule-of-thumb sort of way. But now it has been subjected to experiments aiming at quantitative scientific measurement. These were reported by Dr. A. L. Winsor and Dr. E. I. Strongin of Cornell University, before the American Association for the Advancement of Science.

The persons tested were given varying amounts of alcohol, according to the degree of their resistance to its effects. The doses ran from 30 to 75 cubic centimeters of grain alcohol, diluted with twice the quantity of water—roughly the equivalent of one or two stiffish drinks of pre-repeal gin. Their degree of intoxication was measured in two ways: by the amount of secretion from one of the salivary glands, and by the number of errors made in trying to follow a moving object with a slender beam of light.

It was found that about a pint of coffee, made by a uniform method and moderately strong, was required to counteract the effects of the alcohol, if taken at the same time with it. Coffee taken after the alcohol had less effect in cancelling out the latter drug.

*Science News Letter, January 6, 1934*

## GENERAL SCIENCE

## Smithsonian Adds Third Of Million Specimens

**H**EA T rays of extra-long wavelengths, and their reactions upon striking the ozone layer in the upper levels of the atmosphere may have a peculiar significance in the earth's loss of heat to outer space, Dr. Charles G. Abbot, secretary of the Smithsonian Institution, informed his Board of Regents at their annual meeting. Among the forward steps in research conducted at the Institution was the development of an especially sensitive radiation-measuring device for detecting and recording these long wavelengths.

The acquisition during the year of over a third of a million new specimens for the U. S. National Museum was another item reported by Dr. Abbot; the exact count was 348,012. They included such diverse things as the skull of a bowhead whale, several important art collections, botanical specimens from all over the world, objects of South American, Philippine and African workmanship, and a number of meteorites.

At the National Zoological Park, over 1,300 animals were added, offset by 1,000 lost through death and exchange, leaving the Zoo's population at the end of the year at 2,496 animals.

*Science News Letter, January 6, 1934*

## PALEONTOLOGY

## Bird-Like Dinosaur Found in Arizona

**P**ALEONTOLOGISTS at the University of California have discovered the fossil remains of a bird-like dinosaur which inhabited the sand dunes of northern Arizona about 80,000,000 years ago. This animal belonged to the Jurassic geologic period. It walked on its hind legs, and looked somewhat like a featherless ostrich.

The discovery of its remains was made by members of the party of Ansel F. Hall, Chief forester of the U. S. National Park Service, who led an expedition into the Monument Valley of Arizona some months ago.

The find is considered to be of great value, because it is unusual to discover fossil remains of these animals, owing to the fact that the delicate nature of their bones does not lend them to fossilization.

*Science News Letter, January 6, 1934*

## ASTRONOMY

# Bright Stars Fill The Sky

## Season of Brilliance in Heavens Brings Interesting Stars and Constellations to Attract Sky Gazers

By JAMES STOKLEY

**T**HE WINTER evening skies, which contain more bright stars than those of any other part of the year, are seen this month in all their glory.

High in the south is a circle of seven first magnitude stars, with another, Betelgeuse, at the center. Above Betelgeuse is Capella, part of Auriga, the charioteer; then comes Aldebaran, the eye of the bull, Taurus, whose face is marked by the V-Shaped group called the Hyades. Below is Rigel which, like Betelgeuse, is part of Orion, the giant warrior. This group can be identified by the row of three stars forming Orion's belt.

Towards the southeast is Sirius, the dog star, which helps to make up Canis Major, the greater dog. Sirius is the brightest star in the sky and the nearest of those ordinarily seen from the United States. Above is the lesser dog, Canis Minor, with the star Procyon; and still higher are the twins, Gemini, with Pollux, below, and Castor above.

High in the west, to the right of the Hyades, are the Pleiades, the famous "Seven Sisters" of mythology. Six stars can be seen with the unaided eye, a pair of opera glasses reveals several more, and photographs made with modern telescopes show thousands.

In the east is Leo, the lion, in which can be found the "sickle," the blade of which forms the lion's head and with the brilliant Regulus at the end of the handle, which points downwards. To the northeast is the great dipper, with the handle also downwards, and the pointers above. Actually this is the constellation of Ursa Major, the great bear, and the handle is the bear's tail; Following a line from the pointers to the left, we come to Polaris, the pole star, at the end of the handle of the little dipper, and beyond, to the west, is the W-shaped group of Cassiopeia.

Though Venus, and possibly Saturn, can be glimpsed low in the west just after sunset at the beginning of January, no planets are well placed now to

be seen throughout the evening. The presence of a number of the most interesting constellations, however, more than makes up for their lack.

Without doubt the finest of all the star groups is Orion, the mighty hunter. This evening you can see it in the southeast. First of all, look for the row of three stars of nearly similar brilliance; the row is not quite vertical but slants a little to the south. Above the three is another star, a little brighter than any of the belt stars. Farther to the left and a little lower is a very brilliant star with a distinctly ruddy hue. About the same distance from the belt on the opposite side is still another of nearly equal brightness, but bluish in color.

### Imaginative Ancients

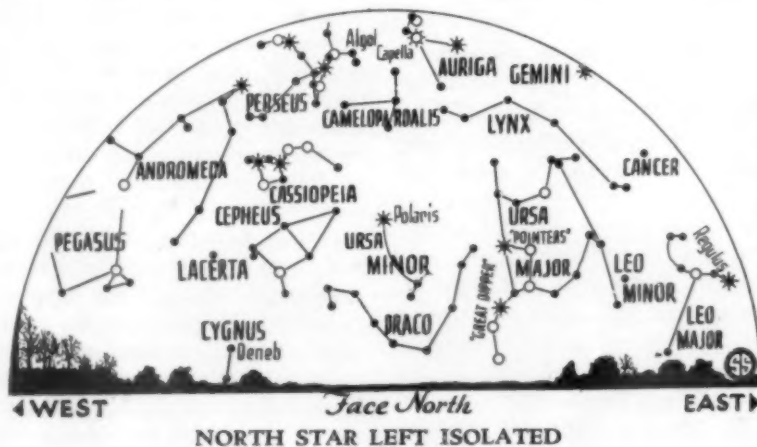
These are the most familiar stars of Orion. The star above the belt is Bellatrix. The bright reddish one is called Betelgeuse; the other bright one Rigel. The three stars of the belt, beginning with the upper one, are named Mintaka, Anilam and Alnitak.

To us unimaginative moderns, almost any figure could be drawn around this group of stars, and probably the last thing that we would think of would be a giant hunter, with a lion's skin thrown over one arm, and an uplifted club in the other. Yet this is just the way the ancients pictured the constellation, and they invented an elaborate story about the hunter, Orion, as they did about so many of the star groups.

According to Homer, Orion was "the tallest and most beautiful of men," and apparently he himself admitted it without question. To punish him, the gods sent a scorpion which stung him in the foot and killed him. Possibly because Orion also was a hunter, Diana interceded for him, and so he was placed in the skies. The scorpion was placed in the opposite part of the sky, as far away from Orion as possible. Thus Scorpius is a conspicuous constellation of summer evenings, just as Orion adorns the skies now.

Betelgeuse is in Orion's right shoulder, Bellatrix in his left. Rigel is his uplifted left foot, the right one is not represented. The double row of faint stars extending northwards from Betelgeuse is the club, and a curved row to the west of Bellatrix is the lion's skin. The row of three stars is the belt, and hanging from it is the sword. Saiph, a fainter star about as far below the belt as Bellatrix is above it, marks the right knee.

These fancies about the constellations are no longer taken seriously, and small wonder, because the facts that astronomical science has revealed about them are far more romantic and wonderful. Take Betelgeuse, for instance. The astronomer calls this alpha Orionis, which means that it is the brightest star in this constellation. About 1918 two famous astronomers, one an American, Prof. Henry Norris Russell, of Princeton, the other an Englishman, Dr. (now Sir) Arthur Eddington, of Cambridge University, announced that their calculations showed that this star was so vast that, if it were hollow with the sun at its center, the earth could





continue to revolve in its accustomed orbit, 186 million miles in diameter, without passing through the imagined shell of Betelgeuse.

In making this deduction the astronomers used an important physical principle, the Stefan-Boltzmann law, by which it is possible to calculate the energy sent into space by every square inch of a star's surface, if the star's temperature is known. Modern astronomical instruments permit a measure of the temperature. Other measurements reveal actual brightness (sometimes different from apparent brightness because a bright star far away may not look so brilliant as a fainter star much closer), and color.

### Measurement Checks Calculation

From these data the astronomer can compute the total energy that the star's entire surface is radiating. When he knows the amount given out by each square inch and the radiation from the entire star, it is easy to find out the total area in square inches. Then, because all stars are spherical, the diameter can be found.

When these results were first announced, they caused considerable surprise. Can there be stars so much larger than our sun, which, after all, is a typical star, it was asked. But any skepticism was silenced in 1920 when Dr. F. G. Pease, of the Mt. Wilson Observatory in California, applied the interferometer, an instrument invented by the late Dr. A. A. Michelson, to the problem. Used as an attachment to the 100-inch reflecting telescope there, still the largest in the world, the actual diameter of Betelgeuse was measured, and found to be about 215 million miles, thus amply justifying the predictions. After the first success of the interferometer, it was applied to several other stars, two of which were found to be

even larger. It was also applied again to Betelgeuse, and thus the discovery was made that this remarkable star does not remain of the same diameter, but seems to be pulsating like a huge heart. When largest, its diameter is about 260 million miles; and when smallest, about 183 million.

Another interesting fact about Betelgeuse is that it is possible to calculate the star's mass, that is, the total amount of matter that it contains. Knowing mass and size, we may find the density; and this turns out to be hundreds of times less than that of the air we breathe. If we had a piece of Betelgeuse on the earth, it would be according to our standards a pretty good vacuum, yet this body is sending out light all the time, about 1600 times as rapidly as the sun. Even though it is so far away that its light takes 240 years to reach us, it is still one of the brightest stars in our sky.

Betelgeuse is not the only interesting thing about Orion. If the night is dark and clear, look at the row of stars hanging downward from the belt, which forms the sword. Perhaps you can see that one of them seems a little hazy.

### Great Nebula of Orion

Seen through a telescope, there is visible a hazy area which is called the great nebula in Orion. This is a mass of glowing gas of which photographs made with the greatest telescopes reveal a wealth of detail. Apparently the gas is made to glow by the energy radiated from a group of stars in the heart of the nebula, called the trapezium. The nebula proper is so large that a beam of light takes about three years to cross it. But even this is not the whole story.

A few years ago Dr. Frank E. Ross of the Yerkes Observatory designed a new astronomical lens that makes photo-

graphs which were quite impossible with the older lenses. One of his pictures is of the whole constellation of Orion and was made with an exposure of many hours, giving the faint light plenty of chance to sink into the plate. On this photograph a nebulous cloud can be seen permeating the entire constellation, and the "great nebula" is merely the brightest part. It has also been found that some of this nebulosity is not bright, but dark, and can be seen in silhouette against the luminous background. One particularly striking piece has the shape of a horse's head and seems to be pushing through a sheet of bright nebulosity.

Much more might be said about Orion and the interesting bodies that the constellation contains, but surely these are enough to give some justification to its title as "the finest constellation in the sky." And surely these facts which modern astronomical science reveals about it are even more romantic than the old mythological stories.

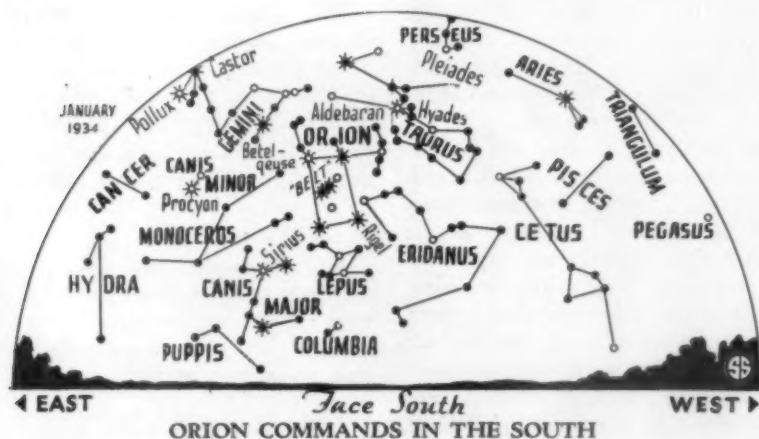
Orion is not the only conspicuous group of stars now in the evening sky. Above this group is a reddish star, Aldebaran, marking the heavenly bull, Taurus, that Orion is about to strike with his club. Aldebaran is part of a famous loose cluster of stars called the Hyades, which have the shape of a V.

### Numerous Pleiades

A little higher still is an even more famous cluster, the Pleiades, six of which can be seen easily with the naked eye. Even a small telescope shows more than a hundred, while as many as two thousand have been counted on a photograph of the region. Astronomical photographs also show a cloud of nebulous material surrounding the stars, apparently shining with light reflected from these stars. It is estimated that the center of the Pleiades is about 350 light years away, and that the distance across the cluster is about a tenth as large.

Below Orion is the most brilliant star in the heavens, Sirius, the dog star, marking the constellation of Canis Major, the greater dog. This canine is one of the two that accompany the hunter. Canis Minor, the other, is to the east and higher, with the brilliant Procyon to distinguish it. Continuing around to the north, and a little higher, are Gemini, the twins, Pollux is the brighter of the two; Castor, the fainter, is located just above his twin.

Nearly overhead and to the north of Aldebaran is Capella in Auriga, the





Charioteer, another first magnitude star.

Now let us look at the western sky. Half way from horizon to zenith, resting on one corner, is the great square of Pegasus, the upper star of which is in Andromeda. Just north of Andromeda is Cassiopeia, the familiar W-shaped constellation, which is supposed to represent a seated woman. In the southwest is Deneb Kaitos, part of Cetus, the sea monster that was sent to devour the fair Andromeda while she was chained to a rock, but from which Perseus rescued her, with the aid of Pegasus, on which he was mounted. In the northwest is Cygnus, the swan, sometimes called the northern cross. The cross is now vertical, with the brilliant Deneb at the top. To the north of Cygnus and close to the horizon can be seen Vega, part of Lyra, which is soon to disappear from the evening sky for a few months.

No planets are well placed in the evening sky this month. Venus is in the constellation of Capricornus, which sets soon after sunset. It is so bright now, however, of the minus 4.3 magnitude, that it can easily be seen in the gathering dusk. No other star or planet is so bright. Mars is in the same constellation, but much fainter and still closer to the sun, so that it is now quite invisible. The same thing is true of Saturn, which is close to Mars. On the seventeenth, these two planets are within nine minutes—less than a third the diameter of the full moon, of each other. If they were in a part of the sky where they could be seen, this would be a beautiful spectacle.

Jupiter, largest of the planets, is in the morning sky, near the star Spica, in Virgo, which rises about 1:00 a. m.

#### Phases of Moon

In January the moon goes through its phases as follows: on the 8th it is at last quarter, on the 15th new, on the 22nd first quarter and on the 30th full. On the latter date it will partly enter the shadow of the earth producing a lunar eclipse, which, unfortunately, will not be visible from this country.

On January 2 the sun was in perihelion, which means that it was closer to the earth, by several million miles, than at any other time of the year. Despite its proximity, this time of the year is cold. This is because the sun is so low in the sky that its light and heat reach us in the northern hemisphere at a glancing angle. Thus the heat is more widely dispersed than in the summer when the sun, though further away, is more nearly overhead.

During the coming year there are several interesting astronomical events scheduled. Most important, perhaps, is a total eclipse of the sun, visible from the middle of the Pacific Ocean, on the 13th and 14th of February. More details of this will be given next month.

On August 10 there will be another solar eclipse, visible in South Africa, but this will be annular, with a ring of the sun's disc remaining visible around the moon even while the eclipse is at its height. Another partial eclipse of the moon will occur on July 26 and will be visible in the western part of the United States.

The brightest star to be eclipsed, or occulted, as seen from the United States, is sigma Sagittarii, of the second mag-

nitude. On April 6, the moon will pass in front of this body for the people in the western states. But those in the East need not feel disappointed, for it will be occulted again on July 25, and this time they will see it. On November 21 the moon passes in front of a number of the Pleiades.

Several comets are expected to make their return this year, among them being Encke's, which was discovered in 1786, and returns every three and a third years. It has been observed on nearly every return since it was first found, but it never becomes brilliant enough to be seen without the aid of a telescope. In addition, several hitherto unknown comets are certain to make their appearance.

*Science News Letter, January 6, 1934*

#### PSYCHIATRY

## Need for Affection May be Cause of Stomach Ulcers

**T**HE CAUSE of stomach ulcer and other gastrointestinal disorders is often mental; they are brought about by a continuous exciting of the functions of the digestive organs by the unconscious mental processes of the patient, Dr. Franz Alexander, of the Chicago Institute of Psychoanalysis, reported to the American Psychoanalytic Association meeting at Washington, D. C.

A study of the personality of sufferers from peptic ulcer revealed to Dr. Alexander that they are typically of the go-getter, independent, efficient, successful type. They are those who delight in doing for others, in giving to others and having others dependent upon them. But underneath all this successful and independent exterior, there is suppressed an overwhelming desire for love and affection from others, he found. Although they do not admit it even to themselves, these individuals have a vital need for the care and affection such as a mother gives.

Since this need for love and protection is associated in very early life with the receipt of nutrition, it automatically sets off the digestive functions of the stomach which normally are dependent upon the process of nutrition, Dr. Alexander explained. When the need is overwhelming and suppressed, the stomach and digestive organs are kept constantly in the state normally aroused only when food is taken or about to be taken.

The irritation from this constant overwork of the digestive processes produces the ulcer.

One patient, cited by Dr. Alexander, was cured of his trouble when he fell in love with a quiet, motherly type of woman who was ardently devoted to him.

Another type of personality was found by Dr. Alexander to be characteristic of the patient suffering from elimination diseases such as mucous colitis. These individuals are aware of their need for service and affection and in fact are constantly complaining that they do not receive all they deserve in view of what they do for others. The service given by these persons is most generally confined to lip-service instead of real doing.

Still another type is found in the chronic sufferer from constipation. These persons excuse their lack of willingness to do for others by saying that no one does anything for them. They do not expect anything and so do not need to give. They cannot relax because of a real, although unconscious, fear of "starvation."

Dr. Alexander told of one patient who was afforded relief from her symptoms when her husband unexpectedly brought her home a gift—the first he had given her in many years of marriage.

*Science News Letter, January 6, 1934*

RADIO

# New Device Takes Advertising Out of Radio Programs

**Talk Eliminator, Similar to Automatic Volume Control, Depends for Operation on Pauses in Human Speech**

A DEVICE that automatically takes the talk, including advertising, out of radio programs has been developed by Prof. Gleason W. Kenrick, of Tufts College, Mass., who demonstrated this radio talk eliminator to the American Association for the Advancement of Science.

Seemingly endowed with intelligence and discrimination, this robot radio censor looks like a supplementary radio set that is hooked up with a conventional radio broadcast receiver. Actually, the talk eliminator works automatically and utilizes a combination of electrical devices which result in the impartial suppression of all talk and announcements, along with advertising "plugging," that some radio listeners find objectionable.

The radio talk eliminator hook-up is such that whenever there is a quarter of a second silence in the program, the radio set is silent for ten seconds. When a speaker stops for breath, his momentary silence, detected by the talk eliminator, in turn silences the radio to his message for ten seconds. The detecting "brain" in the talk eliminator is a detector amplifier similar to the automatic volume control devices now commercially incorporated in radio sets. Whenever the current in the "brain" tube drops to zero for the predetermined fraction of a second, a selective relay comes into action that silences the radio for a predetermined length of time.

## Ten-Second Omissions

Prof. Kenrick has found that setting the talk-hating robot for ten seconds of silence is an effective antidote for most radio chatter. A very fast talker, like Floyd Gibbons, can beat the eliminator which can not silence him until he stops for breath. Music, which is usually continuous, passes inspection by the censor robot except in the rare instances when there are dramatic pauses as there often are in symphonic compositions.

Radio broadcasting stations will be able to counteract the use of the talk

eliminator, if many listeners equip their sets with them, by supplying a musical background to all announcements and advertising speeches. But if the talk eliminator is thus thwarted, Prof. Kenrick promises to improve it by adding some sound filters which will have the ability to differentiate between musical sounds and the sound of the human voice.

*Science News Letter, January 6, 1934*

PHYSIOLOGY

## Blood, Not Nerves, Carries Tetanus Poison to Brain

"LOCKJAW" poison is carried to the brain and spinal cord by the blood, members of the American Association were told by the retiring president of the Association, Dr. John Jacob Abel, emeritus professor of pharmacology at the Johns Hopkins Medical School and now director of the laboratory of endocrine research at the same institution.

This conclusion, which is contrary to the now widely held belief that this poison is carried to the brain by the nerves themselves, was reached as a result of studies carried out during the past year by Dr. Abel and his associates.

"A boy with 'lockjaw' is as truly poisoned as if he had been bitten by a rattlesnake," Dr. Abel said in describing this frightful disease.

The disease occurs as a result of infection with a germ called the bacillus tetani. It is fortunately one of the rarer diseases of man, Dr. Abel pointed out, but it appears more frequently during time of war and on such occasions as Fourth of July celebrations.

The tetanus toxin or poison, which is the true cause of the disease, appears during the growth of the bacilli in an infected wound or cut. Nothing whatever is known of the chemical nature of the poison. When it reaches certain cells of the brain and spinal cord it induces generalized convulsions of the most violent nature. Only the poison of the botulinus organism is stronger than tetanus poison.

Dr. Abel described briefly the scientific experiments which led to his conclusion that this extremely potent poison is carried to the brain and spinal cord by the blood rather than by the nerves.

*Science News Letter, January 6, 1934*

PLANT PATHOLOGY

## Copper Cures Sickness of Florida Orange Trees

COPPER, used with success in the treatment of certain types of anemia in animals and men, has been used to cure a lack of the green coloring matter, chlorophyll, in plants. At the meeting of the Botanical Society of America, Prof. W. E. Burge of the University of Illinois told of experiments with copper sulphate on "frenched" orange trees, whose leaves were spotted yellow.

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Four months after the trees had had a dose of copper sulphate scattered on the soil around their bases, they were thrifty, healthy and actively growing, their leaves glossy green. Similar "frenched" trees left without a ration of copper were still "frenched" and unhealthy-looking. The leaves of the copper-treated trees, upon examination, proved to have 4.6 times more chlorophyll in them than did the leaves of the untreated trees.

*Science News Letter, January 6, 1934*

#### RADIO

### Diagram Classifies Radio Tubes

**S**O MANY vacuum tubes are now manufactured for radio and other electrical uses that a complex graphical diagram for listing and selecting them must be used by engineers, Dr. Harry Rowe Mimno of Harvard University told the Institute of Radio Engineers meeting in Boston.

"During the past two years the number of available types of tubes has increased so rapidly that some radio journals have started 'Tubes of the Month' departments," Dr. Mimno explained.

A method of charting kinds of tubes, devised by a Russian, S. J. Zilitinkevitch, has been adapted to American conditions. Dr. Mimno has classified 125 tubes ranging from the tiny "peanut" tube used in the smallest battery-operated receivers to the larger water-cooled multi-electrode transmitting tubes. Any technician can plot a new tube upon the diagram and then compare its properties with the tubes that he has been using.

*Science News Letter, January 6, 1934*

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#### ETHNOLOGY

## West African Negroes Have Thirteen Kinds of Marriage

**I**F YOU think American marriage and divorce are complicated, consider the natives of West Africa.

Thirteen forms of marriage are recognized, Dr. Melville Herskovits of Northwestern University said, reporting what he has learned about marriage and divorce among Negroes of Dahomey. The report was made before the American Anthropological Association in session in Columbus, Ohio.

In some forms of West African marriage, the arrangements call for the husband to assume certain obligations and to have control of the children, if any. In other marriage forms, the wife controls the children, and the husband has no obligation to maintain the family.

If a Dahomean princess marries a commoner, the husband must renounce all claim to the children, for descendants of the royal household must belong to the royal side of the house.

To add to the complications of 13 possible ways of getting married, polygamy is recognized in Dahomey.

Marriage is always proposed by a girl's father, and divorce must always be initiated by her family.

"For a man in Dahomean society to refuse a woman who has been offered to him is boorish," explained Dr. Herskovits, "and should he feel compelled not to accept the offer he must resort to subterfuge."

If he wants a divorce, likewise, he manages it by subtle means. He makes his wife unhappy enough so that she starts the divorce machinery, by asking her family to take her away from her husband.

If a serious quarrel arises among the branches of a family, there may be wholesale divorce affecting many matches, and causing much trouble.

"The multiplicity of marriage types which may obtain in a single culture has not been recognized to the extent that is desirable," said Dr. Herskovits, discussing theoretical significance of his study. "It is possible that such diversity of types may be discovered in other cultures where a single marriage-form has been assumed."

*Science News Letter, January 6, 1934*

#### PLANT PHYSIOLOGY

### Roots Grown Free From Tops of Plants

**T**HOUSANDS of growing root tips have been kept alive and increasing rapidly for over a year, without any attachment to their parent plants, and fed only from an artificial liquid medium, at the Rockefeller Institute for Medical Research, New York. The experiment was described by Dr. P. R. White, before the American Society of Plant Physiologists.

The roots used were those of tomato plants. The growing tips were cut off and placed in the nutrient liquid, where they continued to increase and multiply in a manner reminiscent of the famous chicken-heart tissue culture started at the same institution many years ago. One of these tomato-root isolations, Dr. White reported, has produced approximately 20,000 growing points, from an initial fragment less than half an inch long. The ratio of the original bit of material to the resultant growth is expressed by the fraction written as 1 over 10 followed by nineteen zeros, so that there is no doubt that the new growth was made by the roots out of the material present in the liquid medium.

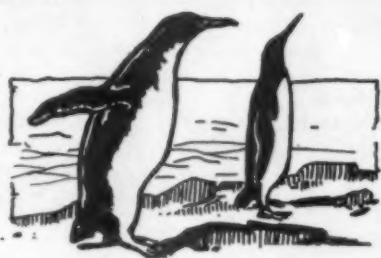
*Science News Letter, January 6, 1934*



## NATURE RAMBLINGS

by Frank Thone

ORNITHOLOGY



### Very Solemn Citizens

THE HIGH interest in the Antarctic that centered recently around Antarctic expeditions has brought into prominence most of the more interesting of the comparatively few animal species that inhabit that desolate end of the world. Among mammals, whales and sea elephants have held the front of the stage; among birds it has been albatrosses and penguins.

The penguins are among the most interesting of all the folk in feathers. They have been "fishers on the wave" for so long that they have totally lost the power of flight, and now use their plumeless wings only as swimming flippers, like those of the seal or whale. This matter of having four propellers instead of only two, as most birds have, gives them a tremendous advantage when swimming under water in pursuit of fish, which form their chief food.

They are also distinguished in being about the only creatures in the world, apart from man, who habitually go about in a completely upright position. Other two-legged creatures, in especial other birds, still hold their bodies more or less horizontally, presumably a reminiscence of original quadruped habit.

This erect habit, coupled with the shortness of their legs, compels them to a very short-strided, waddling, often hopping gait, which looks very comical to our superior human eyes. It must look all right to the penguins, however, for they have never been seen laughing at each other. In fact, they are about the most sober humorless birds in the world. Their affairs are conducted with the utmost seriousness; in their meticulous dress of black and white they look for all the world like so many little Old-World town councillors.

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PSYCHIATRY

## Mental Disease Found Common in Indians

PREVALENCE of mental disease among a tribe of Canadian Indians was reported before the American Sociological Society, meeting in Philadelphia, by Dr. John M. Cooper of the Catholic University of America.

Dr. Cooper, who has spent much time studying the culture of these Northern Cree Indians on Hudson Bay, described his efforts to learn something of their mental troubles. The mental diseases of primitive men, he explained, are an almost untouched field of science.

About 85 per cent. of these adult Cree, at least among the women, are subject to hysteria, Dr. Cooper stated, saying that this large estimate was made by a priest who has lived for 11 years in their country. The more common symptoms of the hysteria are convulsions, hallucinations, melancholia, insensibility to pain, and catalepsy. Rather frequently an Indian affected will run from the tent into the woods, in flight. Abnormal fears, perhaps distinct from hysterical states, occur frequently. Such Indians dread leaving the lodge or going hunting alone.

The other mental illness noted among the Cree is thought by Dr. Cooper to be unique. This is the Wihtigo psychosis, which shows itself as an abnormal craving to eat human flesh and a delusion of being transformed into a Wihtigo. A Wihtigo is a supernatural being supposed to have cannibalistic tastes, and much feared by Cree Indians.

Explaining the basis for this unusual mental disease, Dr. Cooper said that in desperate times of famine the Cree have been driven to eat human flesh. Often in such cases they were suffering from mental breakdown. In their struggle against hunger, and their horror of cannibalism and of breaking tribal taboos against it, some of the famished Indians emerged from their conflict with a craving for human flesh and delusions of being cannibalistic creatures. This Wihtigo psychosis occurs among both men and women.

Hysteria and kindred types of mental disease are extremely common among Cree, sub-polar peoples, and the Malaysians, Dr. Cooper stated. The graver psychoses are seemingly more rare, but far more exact statistical data and studies of individual cases are needed, he urged, to explain the mental ills of the primitive.

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ICHTHYOLOGY

## Fish Grow Best in Water That Is Not Too "Clean"

IT IS NOT good for a fish to be alone.

Fish make better growth in water that has been "conditioned" by keeping a number of their species in it than they do in absolutely fresh water, Prof. W. A. Allee of the University of Chicago told the American Society of Zoologists at its meeting in Boston.

In the experiments he outlined, fishes of several species were kept in aquaria of "conditioned" well water, pond water and distilled water, while "control" groups of fishes were kept for comparison in similar but "unconditioned" water samples. In general, the fishes in the conditioned water grew better than their respective controls. Some of the fishes in the unconditioned distilled water actually died, apparently through loss of necessary elements from their bodies into the water. In all cases, fishes lost

chemical substances into the water, but the loss was more rapid into the unconditioned than into the conditioned water.

Prof. Allee postulates the endowing of the conditioned water with some kind of growth-promoting substance from the bodies of the fish that have lived in it. Whatever the substance is, it shows a considerable degree of resistance to heat, for when raised to 21 degrees Centigrade above the boiling point it still retained its effectiveness. It can also be concentrated, heat-sterilized and re-diluted to its original strength without change. The chemical nature of this growth-promoting factor is not known as yet, but preliminary indications are that it is either a protein or associated with a protein fraction.

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# ● First Glances at New Books

## Nutrition

**FOOD PRODUCTS**—Henry C. Sherman—*Macmillan*, 674 p., \$3. This third edition of a valuable book has been completely rewritten to include the many new facts pertaining to foods and nutrition which have been learned during the ten years since the last edition. As indicated by the title, the material presented covers a very wide field, including the economic, nutritional, sanitary and technological aspects of food products. It is not so technical as to preclude lay reading and contains a wealth of information.

*Science News Letter*, January 6, 1934

## Nutrition

**DIETS AT FOUR LEVELS OF NUTRITIVE CONTENT AND COST**—Hazel K. Stiebeling and Medora M. Ward—*Govt. Print. Off.*, 58 p., 5c. Designed primarily for social workers, relief agencies, teachers of nutrition and economists, this very practical discussion by two of the staff of the U. S. Bureau of Home Economics could be used by the intelligent housewife who wants guidance in marketing with a changed income level.

*Science News Letter*, January 6, 1934

## Medicine

**THE PHYSICIAN'S ART**—Alexander George Gibson—*Oxford Univ. Press*, 237 p., \$3. John Locke's notes for a book to be called *De Arte Medica*, together with a brief account of Locke's career, form an introduction to Dr. Gibson's own thoughtful treatise on the same subject. The book will interest physicians and medical students, chiefly.

*Science News Letter*, January 6, 1934

## Biography

**SAINT THOMAS AQUINAS**—G. K. Chesterton—*Sheed and Ward*, 248 p., \$2. Nobody but G. K. C. would have added as a subtitle, "The Dumb Ox"; and he does it only to prove that Thomas' teacher, Albert the Great, was a true prophet when he said that this stolid pupil would one day fill the world with his voice. With Thomas' standing as theologian and philosopher we are not primarily concerned here; and his mastery of the physical sciences of his time failed to surpass Albert; yet even today his tremendous influence in university development has not ceased to be felt, and as recently as

1925 he was still quoted for the discomfiture of the Fundamentalists of Dayton. A study of Thomas therefore is well worth while, especially when it is conducted by an author like Chesterton who occasionally stands us on our heads to focus an image on a fresh and unfatigued spot on the mental retina.

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## Paleobotany

**FOSSIL FLORAS OF YELLOWSTONE NATIONAL PARK AND SOUTHEASTERN OREGON**—Charles B. Read and Harry D. MacGinitie—*Carnegie Institution*, 68 p., 22 pl., paper, \$1.50, cloth, \$2.50. The Carnegie Institution of Washington has been strongly influential in the extension of paleontological knowledge, in part no doubt through the personal interest of the eminent paleontologist who is its president. The present volume brings the first-fruits of investigations in a new field, and of further research in a second region already partly, though by no means exhaustively, explored.

*Science News Letter*, January 6, 1934

## Entomology

**INSECTS**—Gayle Pickwell, editor—*Suttonhouse (Los Angeles)*, xv+304 p., \$3. This book is one of the Western Nature Study Series, produced by the San Jose State Teachers College. It is of course designed especially for the California and Pacific Coast area, but there is much in it that will interest and inspire teachers and nature-interested students everywhere. To find a textbook as brisk and energetic in its style as this, and so excellently and intelligently illustrated, is decidedly refreshing.

*Science News Letter*, January 6, 1934

## Medicine

**"JAKE PARALYSIS"**—L. A. Turley, H. A. Shoemaker, D. T. Bowden—*Univ. of Oklahoma Press*, 57 p., 75c. Besides presenting their own studies, the authors include an historical review of the recent epidemic of that unique disease, "jake" paralysis.

*Science News Letter*, January 6, 1934

## Psychology

**CHILDREN OF PRESCHOOL AGE**—Ethel Kavin—*Univ. of Chicago Press*, 340 p., \$3.50. Reports of research studies of the intelligence and social adjustment of children in nursery schools.

*Science News Letter*, January 6, 1934

## Psychology

**PROBLEMS OF PRESCHOOL AGE**—Ethel Kavin—*Univ. of Chicago Press*, 96 p., \$1. A preprint of part one of the book "Children of Preschool Age," containing nine case studies.

*Science News Letter*, January 6, 1934

## Child Hygiene

**THE MOTHER'S ENCYCLOPEDIA**—*Parents' Publishing Assn.*, 4 vol., 959 p., \$5. Some idea of the scope of this book, to which many authorities on child health and training have contributed, may be obtained from glancing over the contents listed alphabetically for the four volumes: Adolescent boys to eczema; Education to manners; Marriage to school failure; Schools to youthful chivalry.

*Science News Letter*, January 6, 1934

## Education

**PROVISIONS FOR INDIVIDUAL DIFFERENCES, MARKING, PROMOTION**—Roy O. Billett—*U. S. Govt. Print. Off.*, 472 p., 40c. Monograph No. 13 of the National Survey of Secondary Education.

*Science News Letter*, January 6, 1934

## Hygiene

**OUR COMMON ENEMY: COLDS**—Robert M. McBride and Co., 102 p., \$1. The editors of *Fortune* give an amusing and informative review of (1) opinions of leading medical authorities on cause, prevention and treatment of colds; (2) the "cold business" from Smith Brothers to Kleenex. If you follow the physicians' advice and treat your cold by staying in bed, this will help to relieve the tedium.

*Science News Letter*, January 6, 1934

## Ornithology

**CHECK-LIST OF THE BIRDS OF MISSOURI**—Rudolf Bennett—*Univ. of Missouri*, 81 p., \$1.25.

*Science News Letter*, January 6, 1934

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